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# *Coal FLOTATION*

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## 1. General Information

Flotation is a method of separating minerals by making use of different surface and interfacial properties. When most of the minerals enter an aqueous environment, some ions on their surface pass into the water and ensure that the mineral surfaces have certain charges, and minerals get wet by collecting hydrated (H and OH etc.) ions in the water instead of the ions they give to the water. In flotation, some chemicals are used that will collect on the surfaces of the minerals and float the minerals by means of air bubbles that will make the minerals non-wetting. These substances are called collectors. Minerals such as sulfur and graphite, which do not contain ions to react with water on their surfaces and which are generally made up of an element, can float without the need for a collector. Coal is also a naturally floatable material. However, this situation changes according to the degree of carbonization of the coal. For example, while hard coals are naturally floatable, lignite coals can be enriched by flotation only with the addition of reagents due to the water-loving components in their structure. In this respect, in both hard coal and lignite coal flotation, some neutral oils are used in order to shorten the flotation time and increase the efficiency. In addition, cresilic acid, pine oil, and other alcohols are used as frother agents.

## 2. Purpose of Experiment

Investigation of flotation properties of naturally floatable coal.

## 3. Experimental Procedure

**Sample:** 300 gr coal

**Used material-device:** Flotation machine, spray bottle, stopwatch, measure, pH meter.

**Reagents:** Gas oil, MIBC (%1), Kerosen (%1), Montanol 88 (%1)

**Method:** After conditioning a sample of 300 gr Zonguldak hard coal with 40% ash, which has been ground below 0.500 mm, with a collector for 3 minutes, foam will be taken for 3 minutes at its natural pH value. The mixing speed will be taken as constant as 1100 rpm. During the experiments, reagent addition will be made in two stages, and the condition and flotation times will be taken as 3 and 3 minutes, respectively. In the experiment, the effects of collector amount and type on flotation efficiency will be examined.

Groups	Collector amount (g / t)		MIBC (g / t)
	Kerosen	Montanol	
1	100+100		20
2	200+200		20
3	100+100		10
4		100+100	20
5		200+200	20
6		100+100	10

#### 4. Requests

1. Give general information about coal flotation.
2. Write down the procedures in the experiment in order.
3. Write the reasons for the coal flotation.
4. Simply draw the flow chart of a coal flotation facility.
5. Determine whether the flotation is successful or not.
6. Ash content of the products obtained under optimum conditions are given below. To these data create the metallurgical balance table according to and calculate the combustible efficiency.

Product	Ash content
Feed	%40
Concentrate	%12
Waste	%80